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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

ART UNIT

PAPER NUMBER

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/132,156

Applicant(s)

Wittmer et al.

Examiner

Ardin Marschel

Group Art Unit

1655



X Responsive to communication(s) filed on Jun 1, 1999

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

X Claim(s) 30-45 is/are pending in the application.

~~Of the above, claim(s) 1-29 and 46-56 have been canceled. ~~Claims 30-45 are withdrawn from consideration.~~~~

Claim(s) _____ is/are allowed.

X Claim(s) 30-45 is/are rejected.

Claim(s) _____ is/are objected to.

Claims _____ are subject to restriction or election requirement.

Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on _____ is/are objected to by the Examiner.

The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.

received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

X Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

The art unit designated for this application has changed. Applicant(s) are hereby informed that future correspondence should be directed to Art Unit 1655.

Applicant's election of Group I (now claims 30-45) in Paper No. 5, filed 6/1/99, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (M.P.E.P. § 818.03(a)).

Claims 30-45 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Consideration of the instant disclosure, as filed, has failed to reveal written support for the time limitations in the presently pending claims. For example, there is no written basis for the phrase in the last line of claim 30 given as "completed in approximately 60 seconds or less" which is therefore deemed to be NEW MATTER. The closest time disclosures were found on page 29, lines 8-12, but does not contain the 60 second completion disclosure which is contained either directly or via dependence in instant claims 30-34. Claim 35, line 12, also contains NEW MATTER in the phrase "60 seconds or less". The closest disclosure to this is given in the instant specification on page 23, line 20, as a profile time of 30-60 seconds. This does not

give written support for "60 seconds or less" in that 30-60 seconds does not include 29 seconds, 28 seconds, etc. nor does the profile time correspond to only the heating and cooling step time of instant claim 35. The phrase in the last 2 lines of claim 36 given as "holding time of the annealing and denaturing steps to less than one second each" contains NEW MATTER. The closest disclosure is given in claims 10 and 11 as filed as "not greater than 1 second". These claim 10-11 limitations are different from the present claim 36 limitation in that 1 second is included as filed but not in the present claim 36 which therefore contains NEW MATTER. Similarly, the holding temperature of "less than 5 seconds" for the annealing temperature has not been found as filed and is NEW MATTER in claims 37-45 either directly or indirectly via dependence. The corresponding times in claims 38-45 also have not been found as filed and are NEW MATTER. The rate of cooling of 1.48°C per second in claim 39 has not been found as filed and is NEW MATTER. The denaturation holding period of time of "less than 32 seconds" in claims 41 and 43 has not been found as filed and is NEW MATTER. The maintaining of the sample temperature homogeneity "within plus or minus 1°C during heating and cooling steps" in the last two lines of claim 35 has not been found as filed. The closest disclosure to this limitation has been found in the specification on page 35, lines 5-9, wherein a 10 ul sample is maintained within such thermal limits at all times during a 30

second cycle. This page 35 disclosure is not generic regarding sample size or cycle time period but rather is additionally limited to a 10 ul sample and 30 seconds of cycle time. These sample size and cycle time limitations are not present in claim 35 and therefore the increased breadth of claim 35 compared to said page 35 disclosure is NEW MATTER. It is noted, for example, that maintaining such thermal limits for a larger sample, especially, such as 100 ul or larger is a clearly a vastly more difficult practice than for a small sample thus supporting this rejection of broad scope as NEW MATTER in claim 35.

Claims 36-45 are rejected, as discussed below, under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for amplification reactions performed in a capillary vessel, does not reasonably provide enablement for other or any reaction vessels. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. It is firstly noted that instant claims 36-45 lack any capillary reaction vessel limitation. It has been discussed in Wittmer et al.(1991) that temperature cyclers are not available in the biochemical community to perform rapid cycling as summarized in the first full paragraph on page 82, third column. The instant specification also has not achieved the rapid step times as instantly claimed without also utilizing capillary reaction

vessels. More discussion of the slowness of temperature changes is given in said Wittmer et al. reference on pages 78-80 in the DISCUSSION section, first 5 paragraphs, wherein heat block etc. temperature control devices are not capable of changing temperature as rapidly as required in the instant claims. The need for such capillary reaction vessels is discussed in Swerdlow et al.(1993) in the bridging paragraph between pages 512 and 513. In summary, only the practice of capillary reaction vessel usage is instantly enabled so as to achieve the instantly claimed rapidity of temperature step changes. No guidance has been found so as to make such rapid temperature changes without the usage of said capillary vessels.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 30, 31, 33, 35, 37, 39-41, 43, and 45 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Wittmer et al.(1991).

Wittmer et al.(1991) on pages 76-78 teaches various capillary vessel amplification procedures with rapid cycle times. In Figure 1, for example, 30 repetitive cycles are completed in

14-16 minutes which computes to 0.47 - 0.53 minutes or 28 - 32 seconds per cycle. Within each cycle are the temperature raising, holding, lowering steps of the instant claims including first and second temperatures as instantly claimed with differences greater than 15°C as describes on page 77, middle column, first full paragraph. The step completion clearly is 60 seconds or less as also disclosed on said page 77, middle column, first full paragraph. A 10 ul sample definition in the capillary vessel is disclosed on page 76, third column, last sentence, as also required in instant claim 31. The three temperature cycle profile of instant claim 33 is given in Figure 7 on page 80 of the reference. The conditions of the capillary reaction method in the reference appears to be the same as the instant invention wherein a 10 ul sample maintains the temperature homogeneity as required for instant claim 35. See the below cited legal decisions wherein the prior art appears to disclose an instant invention without analyzing some characteristic that is expected to be present if the same materials are practiced. The "less than 5 seconds" annealing temperature limitation of instant claim 37 is given in the reference on page 77, middle column, first full paragraph. The rate limitation of instant claim 39 is given in the reference on page 77, middle paragraph, wherein 92-56 = 36 C in 9 seconds which equals 4°C per second. The denaturation time limitations of claims 41 and 43 is also given in said page

77 disclosure.

It is noted that In re Best (195 USPQ 430) and In re Fitzgerald (205 USPQ 594) discuss the support of rejections wherein the prior art discloses subject matter which there is reason to believe inherently includes functions that are newly cited or is identical to a product instantly claimed. In such a situation the burden is shifted to the applicants to "prove that subject matter shown to be in the prior art does not possess characteristic relied on" (205 USPQ 594, second column, first full paragraph).

Claims 30-45 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Swerdlow et al. (1993).

Swerdlow et al. discloses the same PCR amplification therein as in the above reference but additionally discloses the 0 second programmed denaturation and annealing holding times on page 514, third column, as given in the instant claims directed to such times being less than 1 second.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which

the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103(a).

Claims 30, 31, 33, 35, 37, 39-41, 43, and 45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Haff et al. (P/N 5,827,480).

Haff et al. describes PCR methodology utilizing capillary tubes in column 7, first column, first paragraph. The second paragraph of this same column cites first and second temperatures that are greater than 15 degrees apart with holding or residence times of 1-300 seconds. The lower end of these holding times clearly gives species within the instant claim step times. 10 ul capillary volumes and thermostable polymerase practice are defined in column 12, lines 37-48, as well as short holding times for denaturation etc. as instantly claimed. Taken as a whole Haff et al. discloses a variety of temperatures, holding times, capillary vessels, etc. as given in the instant claims and Haff et al. overall is directed to utilizing these options as desired in amplification reactions.

Thus, it would have been obvious to someone of ordinary

skill in the art at the time of the instant invention to practice the instant invention because Haff et al. suggests and motivates methodology species of the instant claims as summarized above.

The disclosure is objected to because of the following informalities:

Applicants have submitted a PROGRAMMING CODE APPENDIX which has not been amended into the instant specification because of confusion as to where to enter it. Applicants are requested to clarify what is desired as to this appendix. Where it is, or is not, to be amended into the specification should be cleared up.

Appropriate correction is required.

No claim is allowed.

Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Group 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The CM1 Fax Center number is either (703) 308-4242 or (703) 305-3014.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ardin Marschel, Ph.D., whose telephone number is (703) 308-3894. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, W. Gary Jones, can be reached on (703) 308-1152.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Chemical Matrix receptionist whose telephone number is (703) 308-0196.

August 16, 1999

Ardin H. Marschel
ARDIN H. MARSCHEL
PRIMARY EXAMINER